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SUMMARY

This contract provided engineering services to conduct performance tests on an exploratory development aircraft electrical generator, control units and associated equipment. The tasks included modification of the generator coolant test setup and the test of advanced aircraft electric system components.

The first of two generators to be tested developed a ground fault during test which caused a fire. Failure analysis disclosed design deficiencies in the coolant system which will require major equipment modification to correct. This modification will be incorporated into the second generator procured on the contract. Delivery of the second generator was, accordingly, delayed. Modification of the generator coolant system requires changes in the NAVAIRDEVCEN test setup. Effort on this contract was directed to accomplishing this task. Details are contained in this report.

Upon completion of the generator test set changes, contract effort was directed to the instrumentation, operational test, and data compilation of a group of sixteen Solid State Electric Logic (SOSTEL) Terminal Test Panels. These panels provide simulated logic level changes for test of Advanced Aircraft Electrical Systems (AAES). Details of this task are contained in this report.

CONTENTS

INTRODUCTION

1. Background

The Navy is developing an Advanced Aircraft Electric System (AAES) for future military aircraft. The system must be capable of accommodating the vastly increasing demands for electrical power, network complexity, system monitoring/control, and effectiveness in future naval aircraft. The system requires development of a family of components by exploiting advanced technologies in power generation, solid state switching, multiplexing, and computer control techniques.

2. Scope

This task is related to the AAES 270 VDC generator and system components. It includes the modification of a test stand/test setup for performing tests of an exploratory development aircraft electric generator and the instrumentation, operational tests and data compilation of a group of Solid State Electric Logic (SOSTEL) Terminal Test Panels.

270 VOLT DC VARIABLE SPEED GENERATOR
COOLANT SYSTEM MODIFICATION

AiResearch Manufacturing Company, Torrance, CA, under NAVAIRDEVCEN contract, designed and developed a 270 volt DC variable speed aircraft electrical generator and control unit. One of two units delivered to NAVAIRDEVCEN developed a ground fault and caught fire during performance tests. The generator coolant, Monsanto Corporation Heat Transfer Fluid - Coolanol 25, was ignited by the high temperature caused by the fault. NAVAIRDEVCEN/ contractor review of the problem resulted in a decision to modify the generator to use turbine engine oil, MIL-L-23699, as the heat transfer fluid. Because of the fire and decision to use a different generator coolant fluid, the NAVAIRDEVCEN generator test setup coolant heat exchanger system required: Coolanol removal and system purging; repair/replacement of fire damaged components; reassembly of system components in accordance with design requirements; and recalibration, if necessary, because of fluid changes. The Coolanol 25 was drained from the heat exchange system and the system was purged with petroleum ether. A replacement quantity (5 gallons) of petroleum ether and a case (24 quarts) of MIL-L-23699 was ordered and has been received. Mr. Albert D'Arazzio, Trenton Turbine Test Laboratory (443-7011) provided the following MIL-L-23699 characteristics:

Specific gravity - 1.0 (.96 to 1.05 lot variation)		
Viscosity (centistokes)	@ 100°F (37.8°C)	25.0
	@ 210°F (98.9°C)	5.0
	@ 248°F (120°C)	3.4
	@ -40°F (-40°C)	13,000

The generator coolant heat exchanger instrumentation included a Fisher and Porter 5 gallon per minute turbine type flowmeter, Model 10C1510A. This flowmeter had been purchased and calibrated for use with Monsanto heat transfer fluid Coolanol 25. Mr. John Reichert, Fisher and Porter Flowmeter Applications Engineer,

advised that the Model 10C1510A turbine flowmeter can be used with MIL-L-23699 turbine engine oil and the flowmeter will read correctly without recalibration. Mr. Paul Cebam, NAVAIRDEVCEN Code 6061, x2062, has a flowmeter calibrated for flow versus specific gravity which he said could be borrowed to confirm flow calibration, if desired.

The air cooled generator coolant heat exchanger has been reassembled and is ready for use with turbine engine oil MIL-L-23699 as the heat transfer fluid.

SOLID STATE ELECTRIC LOGIC (SOSTEL)
TERMINAL TEST PANELS

The Advanced Aircraft Electric System has a control group, Solid State Electric Logic (SOSTEL) which perform the management function for aircraft electrical systems. The control group normally interfaces with control data sources called transducer switches. These are passive, bilevel devices whose impedance changes with change of state, corresponding to ON-OFF control indications. This portion of the report details the instrumentation, operational test, data compilation, and repair/rework of group of sixteen SOSTEL terminal test panels. Each panel is capable of providing 64 discrete input/output channels in the control group. The control group provides a current pulse to channel and the resultant voltage is sampled by the terminal to determine the state of the channel.

For test purposes, a constant current source was fed to each individual channel as the channel was manually switched thru its operating states. The resultant voltage was recorded for each state of operation. This data will be reviewed to insure compliance with input/output interface voltage band requirements. Channels with outputs outside the specified band limits were/will be repaired or reworked. Switch and power controller channel bands are as follows:

> 10.0 volts	Open/Fault	Band 2
7.92 volts - 6.48 volts	Off/Normal	Band 3
4.62 volts - 3.78 volts	On/Trip	Band 4
< 2.7 volts	Short/Fault	Band 1

Prior to actual data recording, each light emitting diode (LED) associated with each one of the 64 channels on the test panel was tested for proper polarity connection. Forty-two LED's were connected in reverse polarity. Each of these channels required

rework to correct. Emphasis was placed on completing tests and compilation of performance data on the sixteen SOSTEL terminal test panels. Therefore, if a channel failed to operate properly and operation could not be obtained by removal of slight defects, such as a solder bridge, the channel was passed over and test of other channels continued. The failed channel data block was "X'd" out. There were cases where data fell outside the allowable band limit. In some cases, this was caused by a high voltage drop across the LED. Several instances of this high LED voltage drop are presented with the data. There are other cases of out-of-tolerance data in a channel where the test current in the ON/TRIP band tests is recorded below the recorded data for information purposes. These cases are indicated by an asterisk on the ON/TRIP data with a corresponding asterisk on a current reading below. Band 1 data for all channels on each test panel exceeds allowed limits. All terminal test panels will be modified to correct this defect. Tests data sheets for the sixteen SOSTEL test terminals are included on the following pages.

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #1

TEST ENGINEER: T. Boyce | OBSERVERS: | DATE: 25 Sep 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

BAND	CHANNELS 1	2	3	4	5	6	7	8	9	10	11
1	3.41	3.56	3.56	3.52	3.31	3.59	3.48	3.48	3.36	3.54	3.45
2	13.11	13.11	13.11	13.11	13.15	13.10	13.11	13.11	13.14	13.11	13.11
3	7.72	7.79	7.91	7.79	7.58	7.79	7.83	7.72	7.69	7.57	7.74
4	4.43	4.40	4.52	4.63	4.35	4.39	4.60	4.62	4.45	4.41	4.57
	12	13	14	15	16	17	18	19	20	21	22
1	3.57	3.49	3.41	3.47	3.54	3.54	3.41	3.53	3.40	3.56	3.53
2	13.11	13.07	13.11	13.14	13.14	13.08	13.08	13.09	13.09	13.07	13.09
3	7.86	7.60	7.87	7.50	7.63	7.53	7.57	7.58	7.53	7.82	7.93
4	4.59	4.49	4.59	4.42	4.54	4.46	4.44	4.47	4.40	4.59	4.64
	23	24	25	26	27	28	29	30	31	32	33
1	3.57	3.48	3.37	3.59	3.46	3.49	3.35	3.32	3.38	3.40	3.45
2	13.08	13.09	13.11	13.10	13.08	13.11	13.12	13.21	13.20	13.20	13.20
3	7.80	7.66	7.84	8.64*	7.65	7.88	7.63	7.60	7.50	7.68	7.61
4	4.50	4.45	4.58	4.57	4.38	4.49	4.54	4.39	4.38	4.48	4.51
				*Diode	2.99V						
	34	35	36	37	38	39	40	41	42	43	44
1	3.39	3.53	3.46	3.43	3.45	3.34	3.45	3.57	3.43	3.48	3.46
2	13.20	13.19	13.20	13.20	13.20	13.21	13.20	13.20	13.20	13.19	13.20
3	7.61	7.42	7.53	7.58	7.50	7.67	7.52	7.59	7.84	7.87	7.60
4	4.50	4.40	4.48	4.50	4.38	4.60	4.43	4.49	4.56	4.60	4.40

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #1 (Cont.)

TEST ENGINEER
T. Boyce

OBSERVERS

DATE
26 Sep 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

	CHANNELS										
BAND	45	46	47	48	49	50	51	52	53	54	55
1	3.34	3.46	3.30	3.35	3.45	3.45	3.54	3.35	3.42	3.43	3.54
2	13.20	13.20	13.20	13.20	13.20	13.20	13.20	13.20	13.20	13.20	13.20
3	7.43	7.66	7.76	7.90	7.50	7.83	7.69	7.68	7.69	7.64	7.76
4	4.36	4.41	4.48	4.65	4.65	4.60	4.46	4.42	4.49	4.42	4.53
	56	57	58	59	60	61	62	63	64		
1	3.45	3.38	3.48	3.52	3.52	3.39	3.48	3.38	3.40		
2	13.20	13.20	13.20	13.20	13.20	13.20	13.20	13.20	13.20		
3	7.80	7.64	7.58	7.64	7.90	7.78	7.62	7.58	7.60		
4	4.45	4.48	4.54	4.45	4.54	4.56	4.44	4.45	4.15		

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LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #2

TEST ENGINEER: T. Boyce | OBSERVERS: | DATE: 30 Sep 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

	CHANNELS										
BAND	1	2	3	4	5	6	7	8	9	10	11
1	3.40	3.45	3.39	3.55	3.51	3.35	3.47	3.51	3.42	3.45	3.41
2	13.08	13.06	13.05	13.06	13.06	13.08	13.10	13.09	13.09	13.06	13.08
3	7.87	7.69	7.78	8.02	7.75	7.94	8.21	7.76	7.89	7.99	7.64
4	4.63	4.58	4.66	4.51	4.69	4.56	4.67	4.49	4.65	4.77	4.55
	12	13	14	15	16	17	18	19	20	21	22
1	3.48	3.40	3.45	3.44	3.45	3.45	3.54	3.62	3.64	3.38	3.36
2	13.08	13.09	13.09	13.09	13.08	13.09	13.10	13.09	13.10	13.10	13.11
3	7.94	8.13	7.72	7.66	7.81	7.79	7.75	7.58	7.76	7.54	7.81
4	4.70	4.71	4.58	4.54	4.49	4.70	4.63	4.46	4.59	4.41	4.60
	23	24	25	26	27	28	29	30	31	32	33
1	3.37	3.59	3.52	3.48	3.58	3.55	3.52	3.54	3.62	3.44	3.45
2	13.09	13.09	13.09	13.09	13.09	13.09	13.09	13.09	13.10	13.12	13.13
3	7.55	7.80	7.81	7.77	7.78	7.74	7.97	7.81	8.11	7.76	7.52
4	4.47	4.69	4.60	4.38	4.58	4.43	4.64	4.70	4.74	4.53	4.45
	34	35	36	37	38	39	40	41	42	43	44
1	3.52	3.38	3.44	3.44	3.48	3.46	3.55	3.48	3.56	3.46	3.41
2	13.16	13.08	13.15	13.13	13.11	13.13	13.13	13.12	13.12	13.12	13.12
3	7.49	8.57	7.74	7.88	7.82	7.72	7.60	7.99	7.46	7.60	7.50
4	4.40	4.66	4.47	4.46	4.56	4.66	4.50	4.64	4.38	4.56	4.41

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #2 (Cont.)

TEST ENGINEER
T. Boyce

OBSERVERS

DATE
30 Sep 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

	CHANNELS										
BAND	45	46	47	48	49	50	51	52	53	54	55
1	3.28	3.57	3.54	3.42	3.55	3.59	3.62	3.59	3.42	3.62	3.52
2	13.13	13.14	13.12	13.14	13.12	13.12	13.12	13.16	13.14	13.14	13.12
3	7.65	7.61	7.71	7.67	7.56	7.74	7.72	7.67	7.73	8.40	7.91
4	4.57	4.37	4.56	4.45	4.46	4.48	4.66	4.47	4.65	4.63*	4.57
										*10.5 MA	
	56	57	58	59	60	61	62	63	64		
1	3.56	3.55	3.54	3.57	3.53	3.48	3.34	3.46	3.62		
2	13.13	13.15	13.13	13.14	13.16	13.16	13.16	13.14	13.15		
3	7.97	7.81	8.00	7.66	7.75	7.74	8.05	7.77	7.69		
4	4.53	4.65	4.71	4.57	4.43	4.59	4.59	4.39	4.40		

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LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #3

TEST ENGINEER: T. Boyce | OBSERVERS: | DATE: 30 Sep 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

BAND	CHANNELS 1	2	3	4	5	6	7	8	9	10	11
1	3.37	X	3.33	3.36	3.50	3.48	3.57	3.40	3.33	3.57	3.56
2	13.08	X	13.05	13.04	13.02	13.02	13.03	13.02	13.02	13.02	13.03
3	7.76	X	7.77	7.76	7.51	7.91	7.58	7.78	7.52	7.59	7.55
4	4.51	X	4.52	4.51	4.40	4.57*	4.46	4.33	4.36	4.44	4.40
						*10.5 MA					
	12	13	14	15	16	17	18	19	20	21	22
1	3.47	3.43	3.35	3.53	3.36	3.51	3.41	3.38	3.45	3.44	3.38
2	13.05	13.02	13.02	13.03	13.01	13.02	13.04	13.03	13.03	13.03	13.03
3	7.71	7.59	7.48	7.78	7.67	7.59	7.53	7.75	7.45	7.51	7.43
4	4.57	4.45	4.36	4.56	4.46	4.49	4.43	4.66	4.36	4.36	4.35
	23	24	25	26	27	28	29	30	31	32	33
1	3.36	3.48	3.52	3.42	3.33	3.46	3.58	3.41	3.51	3.46	3.57
2	13.03	13.05	13.05	13.04	13.02	13.03	13.02	13.04	13.02	13.04	13.04
3	7.63	7.69	7.60	7.78	7.65	7.90	7.57	7.48	7.60	7.76	7.67
4	4.46	4.58	4.38	4.56	4.56	4.51*	4.51	4.41	4.47	4.54	4.46
						*10.5 MA					
	34	35	36	37	38	39	40	41	42	43	44
1	3.48	3.40	3.51	3.36	3.43	3.54	3.42	3.57	3.34	3.45	3.41
2	13.04	13.04	13.04	13.04	13.05	13.04	13.04	13.03	13.02	13.04	13.05
3	7.77	7.56	7.74	7.71	7.90	7.80	7.46	7.69	7.89	7.40	7.52
4	4.52	4.30	4.55	4.52	4.60	4.54	4.36	4.53*	4.60	4.31	4.30
								*10.5 MA			

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #3 (Cont.)

TEST ENGINEER
T. Boyce

OBSERVERS

DATE
30 Sep 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

	CHANNELS										
BAND	45	46	47	48	49	50	51	52	53	54	55
1	3.45	3.51	3.51	3.46	3.40	3.36	3.43	3.52	3.43	3.41	3.35
2	13.02	13.04	13.04	13.04	13.04	13.02	13.02	13.05	13.02	13.04	13.04
3	7.64	7.54	7.74	7.83	7.88	7.71	7.64	7.71	7.56	7.54	7.57
4	4.54	4.39	4.46	4.56*	4.50	4.38	4.44	4.64	4.31	4.36	4.54
				*10.5 MA							
	56	57	58	59	60	61	62	63	64		
1	3.34	3.44	3.43	3.42	3.47	3.51	3.37	3.43	3.44		
2	13.04	13.04	13.03	13.04	13.02	13.04	13.04	13.04	13.05		
3	7.76	7.66	7.76	7.79	7.63	7.69	7.78	7.52	7.57		
4	4.58	4.42	4.55	4.38	4.59	4.42	4.47	4.46	4.39		

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #4

TEST ENGINEER: T. Boyce | OBSERVERS: | DATE: 30 Sep 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

BAND	CHANNELS 1	2	3	4	5	6	7	8	9	10	11
1	3.21	3.33	3.36	3.34	3.45	3.52	3.37	3.48	3.55	3.38	3.49
2	13.08	13.04	13.04	13.04	13.04	13.04	13.04	13.06	13.05	13.04	13.06
3	7.46	7.70	7.66	7.90	8.00	7.55	7.70	7.63	7.67	7.76	7.70
4	4.35	4.54	4.44	4.57*	4.62	4.35	4.51	4.56	4.50	4.50	4.41
				*10.5 MA							
	12	13	14	15	16	17	18	19	20	21	22
1	3.45	3.41	3.46	3.50	3.59	3.41	3.53	3.51	3.41	3.51	3.56
2	13.07	13.06	12.92	12.92	12.92	12.92	12.92	12.92	12.92	12.92	12.94
3	7.44	7.59	8.00	7.97	7.94	7.85	7.87	7.92	7.85	7.87	7.84
4	4.39	4.60	4.66*	4.62	4.60	4.60	4.76	4.79	4.65	4.52	4.59
			*10.6 MA								
	23	24	25	26	27	28	29	30	31	32	33
1	3.54	3.43	3.56	3.48	3.41	3.50	3.48	3.50	3.48	3.45	3.59
2	12.95	12.94	12.96	12.96	12.94	12.94	12.94	12.94	12.97	12.94	12.97
3	7.53	8.03	7.84	7.77	7.96	7.80	8.05	7.66	7.67	8.01	8.07
4	4.50	4.65*	4.65	4.52	4.62	4.60	4.61*	4.61	4.56	4.78*	4.64
		*10.6 MA					*10.6 MA			*10.6 MA	
	34	35	36	37	38	39	40	41	42	43	44
1	3.58	3.46	3.36	3.48	3.44	3.38	3.39	3.31	3.50	3.56	3.54
2	12.96	12.98	12.98	12.96	12.97	12.97	12.98	12.99	12.97	13.00	12.97
3	7.77	7.79	7.94	7.73	7.89	8.07	7.71	7.93	7.84	7.84	7.74
4	4.50	4.71	4.53	4.66	4.65	4.64*	4.65	4.71	4.53	4.66	4.59
						*10.6 MA					

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF: SOSTEL Terminal Test Panel #4 (Cont.)

TEST ENGINEER: T. Boyce | OBSERVERS: | DATE: 30 Sep 1980

TEST EQUIPMENT: Control Panel Bit Power Controller #1

BAND	CHANNELS 45	46	47	48	49	50	51	52	53	54	55
1	3.43	3.33	3.33	3.52	3.43	3.47	3.30	3.47	3.53	3.38	3.39
2	12.99	12.98	12.98	12.97	12.99	12.98	12.99	12.98	12.98	12.99	12.98
3	7.65	7.78	7.82	7.74	7.94	7.90	7.52	7.90	7.79	7.77	7.80
4	4.40	4.60	4.63	4.53	4.60	4.51	4.49	4.53	4.54	4.59	4.56
	56	57	58	59	60	61	62	63	64		
1	3.42	3.48	3.41	3.57	3.46	3.36	3.42	3.46	3.51		
2	12.99	12.98	12.96	12.99	12.99	12.99	13.00	13.00	13.00		
3	7.77	7.67	7.72	7.65	7.68	7.85	7.84	7.84	7.63		
4	4.59	X	4.49	4.65	4.46	4.60	4.60	4.60	4.39		

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #5

TEST ENGINEER: T. Boyce | OBSERVERS: | DATE: 1 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

	CHANNELS										
BAND	1	2	3	4	5	6	7	8	9	10	11
1	3.47	3.58	3.39	3.64	3.47	3.53	3.65	3.61	3.44	3.51	3.56
2	12.93	12.89	12.90	12.86	12.88	12.89	12.89	12.89	12.90	12.91	12.91
3	7.70	7.62	7.86	7.81	7.71	7.90	7.95	8.02	7.83	7.92	7.75
4	4.59	4.46	4.67	4.53	4.47	4.51	4.66	4.64*	4.63	4.63	4.55
								*10.8 MA			
	12	13	14	15	16	17	18	19	20	21	22
1	3.48	3.53	3.56	3.57	3.52	3.55	3.39	3.47	3.46	3.37	3.40
2	12.94	12.93	12.92	12.95	12.94	12.94	12.94	12.95	12.95	12.98	12.96
3	7.77	7.56	7.74	7.89	7.59	7.80	7.89	7.89	7.73	7.77	7.74
4	4.46	4.40	4.61	4.71	4.44	4.59	4.60	4.69	4.58	4.45	4.49
	23	24	25	26	27	28	29	30	31	32	33
1	3.56	3.51	3.54	3.36	3.54	3.55	3.58	3.39	3.39	3.47	3.41
2	12.94	12.96	12.98	12.98	12.96	12.97	12.97	12.94	12.95	12.96	12.95
3	7.63	8.13	8.07	7.94	7.89	7.80	7.97	7.83	7.78	7.70	7.71
4	4.38	4.75*	4.55*	4.76	4.74	4.59	4.70	4.48	4.59	4.53	4.54
		*10.6MA	*10.6MA								
	34	35	36	37	38	39	40	41	42	43	44
1	3.42	3.42	3.41	3.55	3.47	3.29	3.53	3.50	3.37	3.39	3.39
2	12.97	12.95	12.97	12.97	12.97	12.97	12.96	12.96	12.96	12.97	12.96
3	7.53	7.69	7.61	7.61	7.75	7.54	7.60	7.70	7.75	7.60	7.63
4	4.48	4.60	4.48	4.48	4.49	4.47	4.41	4.46	4.52	4.57	4.49

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #5 (Cont.)

TEST ENGINEER
T. Boyce

OBSERVERS

DATE
1 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

BAND	CHANNELS 45	46	47	48	49	50	51	52	53	54	55
1	3.60	3.45	3.50	3.39	3.56	3.46	3.45	3.48	3.51	3.39	3.55
2	12.95	12.95	12.96	12.97	12.99	12.97	12.97	12.99	12.96	12.97	12.97
3	7.63	7.75	8.00	7.70	7.90	7.82	7.74	7.98	7.72	7.61	7.57
4	4.41	4.52	4.68*	4.49	4.65	4.56	4.62	4.39	4.55	4.52	4.46
			*10.6 MA								
	56	57	58	59	60	61	62	63	64		
1	3.55	3.45	3.40	3.48	3.44	3.48	3.38	3.53	3.29		
2	12.96	12.97	12.97	12.96	12.99	12.97	12.98	12.98	13.03		
3	7.75	8.09	7.60	7.86	7.54	7.74	7.79	7.83	7.60		
4	4.50	4.59*	4.43	4.55	4.34	4.65	4.62	4.45	4.43		
		*10.6 MA									

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #6

TEST ENGINEER: T. Boyce | OBSERVERS: | DATE: 1 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

BAND	CHANNELS 1	2	3	4	5	6	7	8	9	10	11
1	3.21	3.40	3.51	3.42	3.30	3.30	3.41	3.50	3.35	3.41	3.46
2	13.02	13.00	12.99	12.99	13.00	12.99	12.98	12.99	12.98	12.99	12.98
3	7.61	7.63	7.60	7.70	7.54	7.79	7.70	7.75	7.91	7.85	7.74
4	4.45	4.51	4.54	4.55	4.39	4.60	4.42	4.59	4.64	4.46	4.44
	12	13	14	15	16	17	18	19	20	21	22
1	3.52	3.36	3.44	3.49	3.46	3.33	3.49	3.37	3.44	3.56	3.56
2	13.02	13.00	12.98	12.99	12.99	12.99	13.02	12.99	12.98	13.00	12.99
3	7.81	7.59	7.93	7.81	7.61	7.66	7.82	7.90	7.67	7.70	7.01
4	4.45	4.52	4.59	4.56	4.46	4.41	4.56	4.61	4.48	4.49	4.59
	23	24	25	26	27	28	29	30	31	32	33
1	3.42	3.48	3.51	3.36	3.42	3.35	3.55	3.36	3.51	3.43	3.47
2	12.99	12.99	13.02	13.00	13.03	13.00	13.01	13.02	13.03	13.03	13.02
3	7.64	7.67	7.77	7.67	7.73	7.94	7.63	7.58	7.79	7.69	X
4	4.52	4.40	4.48	4.56	4.56	4.58	4.52	4.40	4.51	4.50	X
	34	35	36	37	38	39	40	41	42	43	44
1	3.30	3.43	3.40	3.36	3.36	3.54	3.37	3.50	3.43	3.31	3.51
2	13.05	13.04	13.03	13.01	13.01	13.02	13.02	13.02	13.02	13.02	13.02
3	7.67	7.70	7.47	7.90	7.65	7.69	7.75	7.83	7.86	7.80	7.69
4	4.42	4.53	4.37	4.41	4.52	4.60	4.58	4.53	4.50	4.56	4.51

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #6 (Cont.)

TEST ENGINEER
T. Boyce

OBSERVERS

DATE
1 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

	CHANNELS										
BAND	45	46	47	48	49	50	51	52	53	54	55
1	3.51	3.53	3.52	3.55	3.45	3.44	3.55	3.34	3.44	3.42	3.48
2	13.02	13.02	13.04	13.02	13.04	13.02	13.06	13.05	13.06	13.06	13.00
3	7.82	7.68	7.65	7.74	7.67	7.88	7.63	7.65	7.59	7.60	7.87
4	4.58	4.54	4.39	4.64	4.53	4.57	4.42	4.45	4.46	4.44	4.60
	56	57	58	59	60	61	62	63	64		
1	3.49	3.50	3.32	3.40	3.37	3.48	3.43	3.35	3.46		
2	13.02	13.03	13.02	13.02	13.01	13.03	13.05	13.04	13.04		
3	7.77	7.82	7.54	7.70	7.79	7.64	7.82	7.75	7.57		
4	4.56	4.61	4.41	4.42	4.56	4.48	4.42	4.49	4.45		

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #7

TEST ENGINEER: T. Boyce | OBSERVERS: | DATE: 1 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

BAND	CHANNELS 1	2	3	4	5	6	7	8	9	10	11
1	3.40	3.51	3.48	3.30	3.52	3.34	3.44	3.52	3.45	3.38	3.47
2	13.00	13.06	13.06	13.06	13.07	13.08	13.06	13.04	13.04	13.05	13.05
3	7.49	7.40	7.79	7.50	7.54	7.64	7.76	7.68	7.61	7.57	7.69
4	4.42	4.38	4.59	4.29	4.47	4.47	4.46	4.41	4.48	4.38	4.59
	12	13	14	15	16	17	18	19	20	21	22
1	3.48	3.54	3.46	3.35	3.55	3.39	3.48	3.47	3.47	3.46	3.50
2	13.02	13.02	13.02	13.02	13.02	13.04	13.04	13.03	13.04	13.01	13.01
3	7.51	7.75	7.91	7.75	7.69	7.64	7.54	7.54	7.42	7.49	7.52
4	4.41	4.53	4.54	4.47	4.68	4.32	4.32	4.50	4.34	4.39	4.37
	23	24	25	26	27	28	29	30	31	32	33
1	3.43	3.51	3.51	3.55	3.30	3.40	3.44	3.48	3.53	3.51	3.46
2	13.02	13.02	13.02	13.03	13.01	13.01	13.03	13.02	13.01	13.02	13.04
3	7.58	7.64	7.54	7.79	7.93	7.78	7.57	7.77	7.51	7.71	7.61
4	4.34	4.39	4.44	4.59	4.42	4.59	4.34	4.55	4.48	4.50	4.47
	34	35	36	37	38	39	40	41	42	43	44
1	3.51	3.40	3.52	3.52	3.44	3.56	3.39	3.53	3.30	3.43	3.30
2	13.02	13.02	13.01	13.02	13.05	13.03	13.02	13.02	13.02	13.02	13.05
3	7.63	7.67	7.60	7.59	7.48	7.64	7.91	7.65	7.86	7.50	7.70
4	4.34	4.42	4.56	4.37	4.37	4.36	4.55	4.35	4.55	4.91	4.52

PLATE NO. 20R94

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #7 (Cont.)

TEST ENGINEER: T. Boyce | OBSERVERS: | DATE: 1 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

	CHANNELS										
BAND	45	46	47	48	49	50	51	52	53	54	55
1	3.44	3.45	3.54	3.37	3.42	3.43	3.52	3.35	3.57	3.45	3.51
2	13.02	13.01	13.04	13.03	13.02	13.03	13.01	13.01	13.01	13.02	13.02
3	7.71	7.69	8.08	7.55	7.74	7.67	7.80	7.68	7.72	7.78	7.53
4	4.58	4.52	4.48*	4.32	4.47	4.50	4.44	4.46	4.38	4.45	4.36
			*10.4 MA								
	56	57	58	59	60	61	62	63	64		
1	3.36	3.45	3.47	3.45	3.42	3.46	3.55	3.48	3.30		
2	13.02	13.04	13.03	13.02	13.03	13.04	13.02	13.04	13.04		
3	7.90	7.68	7.56	7.65	7.66	7.85	7.52	7.64	7.38		
4	4.60	4.40	4.37	4.34	4.44	4.55	4.32	4.40	4.29		

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF: SOSTEL Terminal Test Panel #8

TEST ENGINEER: T. Boyce | OBSERVERS: | DATE: 1 Oct 1980

TEST EQUIPMENT: Control Panel Bit Power Controller #1

	CHANNELS										
BAND	1	2	3	4	5	6	7	8	9	10	11
1	3.26	3.34	3.43	3.43	3.32	3.42	3.42	3.54	3.45	3.53	3.45
2	13.06	13.04	13.04	13.04	12.99	12.97	12.95	12.96	12.96	12.96	12.96
3	7.55	7.37	7.49	7.70	7.55	7.81	7.90	7.87	7.64	7.53	7.82
4	4.23	4.33	4.33	4.53	4.48	4.57	4.62	4.44	4.51	4.41	4.46
	12	13	14	15	16	17	18	19	20	21	22
1	3.59	3.49	3.48	3.40	3.52	3.40	3.48	3.45	3.42	3.43	4.40
2	12.96	12.95	12.99	12.97	12.98	12.97	12.98	12.97	12.99	12.97	12.99
3	7.58	7.93	7.50	7.69	7.70	7.69	7.72	7.74	7.71	7.81	7.83
4	4.40	4.64*	4.36	4.36	4.35	4.43	4.49	4.47	4.65	4.58	4.57
		*10.7 MA									
	23	24	25	26	27	28	29	30	31	32	33
1	3.49	3.35	3.56	3.52	3.44	3.36	3.55	3.45	3.42	3.51	3.38
2	12.98	12.98	12.98	12.98	12.99	12.98	12.97	12.97	12.97	12.97	13.01
3	7.89	7.79	7.62	7.72	7.78	7.90	7.83	7.53	7.97	7.65	7.46
4	4.59	4.48	4.56	4.56	4.54	4.59	4.60	4.43	4.56	4.52	4.44
	34	35	36	37	38	39	40	41	42	43	44
1	3.39	3.50	3.50	3.37	3.42	3.41	3.40	3.34	3.47	3.36	3.32
2	12.98	13.00	12.98	12.98	13.02	12.99	12.99	13.00	13.00	13.00	12.95
3	7.53	7.77	7.72	7.82	7.73	8.29*	7.76	7.87	7.61	7.43	7.46
4	4.43	4.48	4.46	4.57	4.51	4.43	4.51	4,47	4.39	4.38	4.38
						*Diode	2.65V				

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #8 (Cont.)

TEST ENGINEER
T. Boyce

OBSERVERS

DATE
1 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

	CHANNELS										
BAND	45	46	47	48	49	50	51	52	53	54	55
1	3.35	3.39	3.33	3.43	3.48	3.35	3.52	3.34	3.30	3.43	3.46
2	13.01	12.98	13.00	13.00	13.00	13.00	13.00	12.99	13.01	13.00	12.99
3	7.67	7.75	7.76	7.72	7.86	7.71	7.68	7.72	7.72	7.81	7.90
4	4.35	4.53	4.44	4.52	4.50	4.50	4.39	4.55	4.51	4.58	4.59
	56	57	58	59	60	61	62	63	64		
1	3.46	3.46	3.39	3.59	3.36	3.48	3.55	3.30	3.47		
2	13.00	13.00	13.00	12.97	13.00	13.00	13.00	13.02	13.02		
3	7.72	7.97	7.72	8.06*	7.87	7.82	7.54	7.63	7.74		
4	4.60	4.58	4.58	4.53	4.40	4.58	4.51	4.49	4.50		
				*Diode	2.39V						

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #9

TEST ENGINEER
T. Boyce

OBSERVERS

DATE
2 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

	CHANNELS										
BAND	1	2	3	4	5	6	7	8	9	10	11
1	3.43	3.39	3.54	3.46	3.53	3.62	3.50	3.43	3.44	3.49	3.43
2	12.99	12.96	12.95	12.96	12.96	12.95	12.96	12.69	12.94	12.96	12.97
3	7.67	7.80	7.76	7.76	7.76	7.71	7.71	7.78	7.67	7.59	7.82
4	4.56	4.70	4.66	4.58	4.69	4.69	4.60	4.64	4.60	4.57	4.64
	12	13	14	15	16	17	18	19	20	21	22
1	3.36	3.37	3.55	3.65	3.42	3.59	3.55	3.54	3.54	3.37	3.50
2	12.97	12.98	12.98	12.98	12.98	12.98	12.99	12.96	12.97	12.97	12.97
3	7.79	7.60	7.85	7.75	7.71	7.87	7.78	7.77	7.71	7.74	7.80
4	4.63	4.51	4.71	4.66	4.65	4.68	4.64	4.62	4.55	4.57	4.71
	23	24	25	26	27	28	29	30	31	32	33
1	3.41	3.40	3.49	3.46	3.58	3.48	3.56	3.52	3.49	3.56	3.53
2	13.00	12.98	12.49	12.97	12.97	12.97	12.97	12.99	12.97	12.97	12.97
3	7.49	7.64	7.75	7.78	7.81	7.86	7.92	7.82	7.77	7.76	7.74
4	4.40	4.50	4.64	4.64	4.60	4.65	4.68	4.69	4.62	4.48	4.58
	34	35	36	37	38	39	40	41	42	43	44
1	3.49	3.42	3.47	3.50	3.48	3.54	3.52	3.47	3.49	3.64	3.51
2	12.97	12.97	12.98	12.74	12.76	12.77	12.80	12.81	12.84	12.84	12.85
3	7.89	7.74	7.65	7.55	7.65	7.81	7.72	7.73	7.85	7.84	7.76
4	4.66	4.46	4.64	4.46	4.59	4.69	4.56	4.53*	4.54	4.70	4.55
								*10.8 MA			

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF: SOSTEL Terminal Test Panel #9 (Cont.)

TEST ENGINEER: T. Boyce | OBSERVERS: | DATE: 2 Oct 1980

TEST EQUIPMENT: Control Panel Bix Power Controller #1

	CHANNELS										
BAND	45	46	47	48	49	50	51	52	53	54	55
1	3.56	3.62	3.63	3.51	3.42	3.61	3.59	3.43	3.56	3.60	3.51
2	12.84	12.86	12.88	12.89	12.93	12.92	12.92	12.90	12.89	12.90	12.93
3	7.79	7.79	7.66	7.81	7.54	7.71	7.63	7.66	7.59	7.79	7.68
4	4.62	4.65	4.64	4.71	4.48	4.60	4.62	4.60	4.43	4.64	4.62
	56	57	58	59	60	61	62	63	64		
1	3.50	3.55	3.61	3.54	3.44	3.52	3.49	3.47	3.51		
2	12.94	12.91	12.93	12.94	12.94	12.97	12.97	12.97	12.94		
3	7.60	7.74	7.63	7.79	7.72	7.76	7.63	7.72	7.73		
4	4.50	4.60	4.57	4.63	4.61	4.58	4.59	4.53	4.54		

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #10

TEST ENGINEER: T. Boyce | OBSERVER: | DATE: 2 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

	CHANNELS										
BAND	1	2	3	4	5	6	7	8	9	10	11
1	3.46	3.42	3.48	3.45	3.36	3.53	3.53	3.54	3.51	3.37	3.48
2	13.06	13.08	13.08	13.08	13.06	13.07	13.09	13.07	13.09	13.07	13.09
3	7.73	7.56	7.58	7.54	7.77	7.71	7.63	7.47	7.46	7.59	7.51
4	4.62	4.37	4.57	4.46	4.60	4.49	4.54	4.37	4.42	4.44	4.40
	12	13	14	15	16	17	18	19	20	21	22
1	3.52	3.35	3.12	3.39	3.46	3.30	3.43	3.44	3.51	3.37	3.38
2	13.09	13.07	13.09	13.07	13.08	13.08	13.08	13.06	13.06	13.05	13.07
3	7.56	7.59	7.57	7.67	7.43	7.58	7.44	7.49	7.61	7.62	7.59
4	4.50	4.45	4.47	4.46	4.38	4.45	4.43	4.40	4.49	4.55	4.36
	23	24	25	26	27	28	29	30	31	32	33
1	3.52	3.35	3.56	3.35	3.39	X	3.27	3.39	3.43	3.50	3.56
2	13.06	13.06	13.07	13.07	13.07	X	13.06	13.05	13.06	13.07	13.04
3	7/72	7.77	7.65	7.53	7.50	X	7.51	7.57	7.63	7.63	7.94
4	4.51	4.54	4.57	4.42	4.45	X	4.39	4.46	4.58	4.54	4.60
	34	35	36	37	38	39	40	41	42	43	44
1	3.53	3.46	3.36	3.48	3.44	3.40	3.47	3.47	3.43	3.55	3.63
2	13.06	13.06	13.05	13.06	13.06	13.07	13.05	13.06	12.81	12.82	12.83
3	7.60	7.67	7.63	7.56	7.60	7.69	7.56	7.68	7.69	7.80	7.89
4	4.57	4.57	4.60	4.47	4.56	4.59	4.50	4.58	4.67	4.73	4.65

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF: SOSTEL Terminal Test Panel #10 (Cont.)

TEST ENGINEER: T. Boyce | OBSERVERS: | DATE: 2 Oct 1980

TEST EQUIPMENT: Control Panel Bit Power Controller #1

	CHANNELS										
BAND	45	46	47	48	49	50	51	52	53	54	55
1	3.61	3.64	3.58	3.62	3.49	3.48	3.64	3.66	3.63	3.36	3.43
2	12.91	12.89	12.89	12.89	12.91	12.90	12.83	12.91	12.89	12.96	12.95
3	7.72	7.63	7.83	7.89	7.80	7.86	7.73	7.90	7.84	7.51	7.63
4	4.56	4.54	4.70	4.72	4.57	4.77	4.64	4.76	4.75	4.44	4.59
	56	57	58	59	60	61	62	63	64		
1	3.39	3.54	3.42	3.56	3.54	3.60	3.36	3.57	3.61		
2	12.95	12.95	12.96	12.97	12.99	12.96	12.96	12.96	12.96		
3	7.60	7.69	7.77	7.82	7.70	7.89	7.77	7.83	7.61		
4	4.52	4.61	4.52	4.67	4.54	4.64	4.66	4.68	4.47		

PLATE NO. 20894

LABORATORY TEST SHEET
NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #11

TEST ENGINEER	OBSERVERS	DATE
T. Boyce		6 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

	CHANNELS										
BAND	1	2	3	4	5	6	7	8	9	10	11
1	3.35	3.29	3.33	3.52	3.57	3.45	3.60	3.49	3.50	3.39	3.35
2	13.02	13.02	13.02	12.98	13.01	13.01	13.02	13.02	13.02	13.03	13.04
3	7.49	7.65	7.73	7.56	7.70	7.60	7.90	7.69	7.63	8.23	7.73
4	4.41	4.45	4.46	4.40	4.48	4.56	4.60	4.63	4.53	4.65*	4.44
										*10.5 MA	
	12	13	14	15	16	17	18	19	20	21	22
1	3.49	3.45	3.54	3.56	3.43	3.52	3.49	3.47	3.46	3.56	3.35
2	13.02	13.02	13.02	13.02	13.04	13.02	13.03	13.00	13.01	13.01	13.02
3	8.15	7.72	7.87	7.95	7.75	7.93	7.53	7.82	7.67	7.79	7.83
4	4.64*	4.58	4.57	4.69	4.52	4.40	4.40	4.63	4.54	4.64	4.64
	*10.6 MA										
	23	24	25	26	27	28	29	30	31	32	33
1	3.50	3.56	3.49	3.50	3.52	3.54	3.29	3.53	3.39	3.46	3.46
2	13.02	13.02	13.00	13.02	13.02	13.06	13.02	13.02	13.02	13.02	13.02
3	8.03	7.87	7.96	7.80	8.26	7.54	7.65	7.82	7.72	7.88	7.35
4	4.62*	4.46	4.64	4.61	4.45*	4.38	4.41	4.40	4.42	4.59	4.30
	*10.6 MA				*10.6 MA						
	34	35	36	37	38	39	40	41	42	43	44
1	3.42	3.35	3.38	3.38	3.34	3.50	3.46	3.49	3.35	3.33	3.36
2	13.05	13.07	13.05	13.02	13.04	13.02	13.04	13.02	13.02	13.04	13.05
3	7.81	7.71	7.67	7.52	7.85	7.70	7.49	7.61	7.81	7.66	7.88
4	4.60	4.47	4.54	4.39	4.66	4.58	4.42	4.36	4.62	4.49	4.63

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #11 (Cont.)

TEST ENGINEER: T. Boyce | OBSERVERS: | DATE: 6 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

	CHANNELS										
BAND	45	46	47	48	49	50	51	52	53	54	55
1	3.52	3.34	3.40	3.49	3.52	3.36	3.54	3.38	3.44	3.41	3.57
2	13.04	13.06	13.07	13.06	13.06	13.07	13.06	13.05	13.04	13.04	13.03
3	7.74	8.01	7.74	7.73	7.41	7.85	7.58	7.70	7.90	7.85	7.95
4	4.66	4.69*	4.64	4.54	4.56	4.56	4.47	4.53	4.54	4.50	4.46
		*10.6 MA									
	56	57	58	59	60	61	62	63	64		
1	3.46	3.53	3.57	3.42	3.33	3.38	3.54	3.42	3.38		
2	13.03	13.03	13.03	13.03	13.03	13.03	13.04	13.04	13.04		
3	7.72	7.71	7.76	7.99	7.63	7.59	7.70	7.76	7.66		
4	4.41	4.61	4.62	4.56	4.41	4.52	4.61	4.56	4.57		

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #12

TEST ENGINEER
T. Boyce

OBSERVERS

DATE
6 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

	CHANNELS										
BAND	1	2	3	4	5	6	7	8	9	10	11
1	3.26	3.38	3.40	3.29	3.44	3.30	3.38	3.39	3.39	3.41	3.55
2	13.02	13.04	13.04	13.04	13.05	13.03	13.05	13.04	13.04	13.05	13.05
3	7.44	7.59	7.67	7.47	7.79	7.86	7.76	7.55	7.51	7.78	7.82
4	4.30	4.49	4.41	4.39	4.54	4.56	4.44	4.47	4.46	4.51	4.42
	12	13	14	15	16	17	18	19	20	21	22
1	3.46	3.46	3.37	3.33	3.39	3.46	3.35	3.57	3.45	3.58	3.33
2	13.04	13.03	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04
3	7.88	7.63	7.65	7.55	7.80	7.67	7.47	7.80	7.69	7.84	7.73
4	4.61	4.47	4.47	4.51	4.62	4.59	4.35	4.56	4.62	4.44	4.46
	23	24	25	26	27	28	29	30	31	32	33
1	3.52	3.45	3.35	3.56	3.43	3.49	3.53	3.54	3.52	3.45	3.36
2	13.04	13.03	13.05	13.04	13.04	13.03	13.04	13.04	13.06	13.06	13.06
3	7.70	7.92	7.64	7.75	7.54	7.73	7.54	7.62	7.84	7.75	7.53
4	4.45	4.50	4.56	4.56	4.42	4.53	4.41	4.49	4.55	4.54	4.39
	34	35	36	37	38	39	40	41	42	43	44
1	3.41	3.35	3.40	3.57	3.32	3.44	3.53	3.54	3.50	3.40	3.56
2	13.06	13.06	13.06	13.07	13.05	13.06	13.05	13.06	13.06	13.06	13.07
3	7.69	7.93	7.64	7.82	7.68	7.47	7.86	7.69	7.71	7.87	7.56
4	4.44	4.59	4.49	4.54	4.59	4.41	4.57	4.46	4.51	4.61	4.53

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #12 (Cont.)

TEST ENGINEER
T. Boyce

OBSERVERS

DATE
6 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

	CHANNELS										
BAND	45	46	47	48	49	50	51	52	53	54	55
1	3.36	3.51	3.43	3.46	3.34	3.31	3.50	3.36	3.46	3.39	3.43
2	13.07	13.07	13.08	13.07	13.06	13.07	13.06	13.06	13.06	13.06	13.06
3	7.60	7.59	7.54	7.74	7.68	7.54	7.58	7.75	7.69	7.72	7.44
4	4.42	4.45	4.44	4.61	4.59	4.47	4.46	4.42	4.56	4.48	4.38
	56	57	58	59	60	61	62	63	64		
1	3.27	3.30	3.36	3.44	3.55	3.30	3.39	3.43	3.34		
2	13.06	13.02	13.02	13.02	13.03	13.01	13.01	13.01	13.02		
3	7.66	7.46	7.77	7.85	7.83	7.55	7.69	7.84	7.79		
4	4.52	4.40	4.46	4.44	4.43	4.44	4.58	4.40	4.52		

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #13

TEST ENGINEER	OBSERVERS	DATE
T. Boyce		8 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

	CHANNELS										
BAND	1	2	3	4	5	6	7	8	9	10	11
1	3.46	3.48	3.47	3.37	3.43	3.48	3.44	3.41	3.58	3.47	3.50
2	13.03	13.02	13.02	13.02	13.01	13.01	13.01	13.02	13.01	13.01	13.01
3	7.57	7.76	7.58	7.68	7.79	7.68	7.90	7.74	7.82	7.76	7.91
4	4.43	4.54	4.40	4.47	4.54	4.44	4.50	4.45	4.60	4.58	4.59
	12	13	14	15	16	17	18	19	20	21	22
1	3.51	3.49	3.45	3.40	3.54	3.56	3.41	3.45	3.47	3.48	3.56
2	13.03	13.01	13.01	13.01	13.02	13.02	13.02	13.02	13.02	13.02	13.02
3	7.54	7.90	7.74	7.81	7.66	7.38	7.60	7.63	7.63	7.85	7.76
4	4.44	4.61	4.60	4.55	4.49	4.36	4.59	4.57	4.48	4.59	4.39
	23	24	25	26	27	28	29	30	31	32	33
1	3.45	3.46	3.47	3.43	3.45	3.48	3.36	3.51	3.46	3.27	3.33
2	13.02	13.01	13.01	13.01	13.01	13.01	13.01	13.01	13.02	13.04	13.03
3	7.74	7.81	7.63	7.99	7.73	7.76	7.70	7.59	7.72	7.55	7.48
4	4.54	4.58	4.56	4.59*	4.43	4.51	4.59	4.42	4.49	4.37	4.45
				*10.5 MA							
	34	35	36	37	38	39	40	41	42	43	44
1	3.34	3.55	3.50	3.46	3.49	3.52	3.43	3.38	3.49	3.45	3.34
2	13.04	13.05	13.04	13.05	13.07	13.05	13.06	13.06	13.06	13.06	13.07
3	7.74	7.72	7.69	7.56	7.79	7.60	7.66	7.58	7.71	7.73	7.58
4	4.41	4.49	4.46	4.34	4.56	4.46	4.56	4.52	4.51	4.53	4.47

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #13 (Cont.)

TEST ENGINEER
T. Boyce

OBSERVERS

DATE
8 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

	CHANNELS										
BAND	45	46	47	48	49	50	51	52	53	54	55
1	3.40	3.39	3.43	3.36	3.56	3.50	3.47	3.52	3.50	3.53	3.49
2	13.12	13.07	13.06	13.06	13.06	13.06	13.07	13.06	13.07	13.07	13.06
3	7.48	7.45	7.37	7.72	7.67	7.73	7.62	7.86	7.60	7.56	7.67
4	4.30	4.42	4.36	4.52	4.60	4.56	4.59	4.56	4.52	4.48	4.46
	56	57	58	59	60	61	62	63	64		
1	3.56	3.45	3.36	3.46	3.51	3.55	3.49	3.41	3.51		
2	13.07	13.07	13.09	13.05	13.07	13.05	13.05	13.05	13.05		
3	7.68	7.79	7.57	7.68	7.78	7.84	7.60	7.66	7.74		
4	4.58	4.60	4.39	4.58	4.59	4.58	4.45	4.52	4.53		

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF: SOSTEL Terminal Test Panel #14

TEST ENGINEER: T. Boyce | OBSERVER: | DATE: 8 Oct 1980

TEST EQUIPMENT: Control Panel Bit Power Controller #1

BAND	CHANNELS 1	2	3	4	5	6	7	8	9	10	11
1	3.38	3.44	3.34	3.48	3.39	3.48	3.46	3.54	3.56	3.45	3.41
2	13.09	13.07	13.06	13.06	13.07	13.05	13.06	13.04	13.06	13.06	13.05
3	7.22	7.66	7.43	8.12	7.76	7.35	8.07	7.69	7.97	7.74	7.71
4	4.25	4.44	4.32	4.42*	4.54	4.35	4.41*	4.42	4.58	4.54	4.38
				*10.4 MA			*10.4 MA				
	12	13	14	15	16	17	18	19	20	21	22
1	3.31	3.43	3.50	3.46	3.46	3.36	3.45	3.33	3.52	3.44	3.50
2	13.06	13.06	13.06	13.05	13.06	13.06	13.06	13.06	13.06	13.06	13.06
3	7.85	7.89	7.66	7.52	7.63	7.66	7.76	7.93	7.53	7.52	7.91
4	4.62	4.60	4.42	4.30	4.39	4.44	4.53	4.59	4.47	4.46	X
	23	24	25	26	27	28	29	30	31	32	33
1	3.41	3.43	3.44	3.49	3.53	3.43	3.43	3.56	3.35	3.36	3.49
2	13.07	13.01	13.06	13.04	13.07	13.04	13.05	13.05	13.05	13.05	13.06
3	7.73	7.72	7.83	7.81	8.15	7.55	7.81	7.63	7.62	7.77	7.52
4	4.52	4.41	4.43	4.48	4.48*	4.32	4.59	4.40	4.54	4.52	4.39
					*10.4 MA						
	34	35	36	37	38	39	40	41	42	43	44
1	3.52	3.47	3.29	3.38	3.42	3.37	3.35	3.48	3.43	3.29	3.52
2	13.06	13.09	13.07	13.07	13.08	13.06	13.06	13.06	13.06	13.05	13.06
3	7.91	7.55	7.56	7.75	7.81	7.70	7.84	7.59	7.75	7.47	7.90
4	4.50	4.40	4.32	4.52	4.46	4.45	4.59	4.50	4.55	4.45	4.56

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF: SOSTEL Terminal Test Panel #14 (Cont.)

TEST ENGINEER: T. Boyce | OBSERVERS: | DATE: 8 Oct 1980

TEST EQUIPMENT: Control Panel Bit Power Controller #1

BAND	CHANNELS 45	46	47	48	49	50	51	52	53	54	55
1	3.40	3.40	3.50	3.39	3.47	3.45	3.53	3.47	3.32	3.43	3.37
2	13.07	13.06	13.06	13.06	13.05	13.07	13.06	13.06	13.06	13.05	13.06
3	7.87	7.83	7.48	7.83	7.60	7.62	7.71	7.60	7.91	7.69	7.63
4	4.40	4.52	4.40	4.60	4.53	4.46	4.56	4.55	4.53	4.53	4.41

	56	57	58	59	60	61	62	63	64		
1	3.45	3.51	3.37	3.40	3.49	3.58	3.37	3.39	3.53		
2	13.06	13.06	13.06	13.06	13.06	13.06	13.06	13.05	13.04		
3	7.70	7.85	7.78	7.55	7.69	7.56	7.69	7.82	7.84		
4	4.57	4.56	4.58	4.39	4.56	4.49	4.47	4.55	4.52		

FTA T O. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #15

TEST ENGINEER: T. Boyce | OBSERVERS: | DATE: 8 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

	CHANNELS										
BAND	1	2	3	4	5	6	7	8	9	10	11
1	3.51	3.60	3.44	3.44	3.51	3.69	3.64	3.56	3.46	3.48	3.63
2	12.79	12.87	12.89	12.90	12.90	12.89	12.90	12.90	12.90	12.90	12.90
3	7.63	7.71	7.76	7.99	7.82	7.77	7.75	7.77	7.71	7.80	7.76
4	4.57	4.56	4.52	4.74	4.64	4.70	4.49	4.69	4.61	4.65	4.64
	12	13	14	15	16	17	18	19	20	21	22
1	3,53	3.56	3.55	3.40	3.50	3.46	3.47	3.55	3.61	3.58	3.59
2	12,92	12,92	12.90	12.92	12.95	12.95	12.93	12.94	12.94	12.93	12.95
3	7.66	7.88	7.73	7.88	7.82	7.59	7.77	7.62	7.50	7.74	7.64
4	4.62	4.74	4.61	4.64	4.69	4.45	4.62	4.54	4.44	4.56	4.60
	23	24	25	26	27	28	29	30	31	32	33
1	3.46	3.64	3.45	3.57	3.45	3.42	3.56	3.43	3.40	3.57	3.43
2	12.94	12.97	12.94	12.94	12.94	12.95	12.98	12.95	12.95	12.96	12.96
3	8.02	7.62	7.63	7.94	7.68	7.79	7.62	7.72	7.62	7.60	7.75
4	4.59*	4.51	4.50	4.69	4.57	4.62	4.53	4.59	4.49	4.55	4.70
	*10.7 MA										
	34	35	36	37	38	39	40	41	42	43	44
1	3.37	3.40	3.61	3.46	3.37	3.51	3.42	3.50	3.56	3.41	3.49
2	12.96	12.96	12.96	12.96	12.96	12.96	12.99	12.96	12.99	12.96	12.97
3	7.79	7.58	7.69	7.81	7.59	7.63	7.91	7.69	7.65	7.67	7.72
4	4.68	4.49	4.70	4.60	4.50	4.57	4.61	4.59	4.49	4.53	4.65

PLATE NO. 20R94

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #15 (Cont.)

TEST ENGINEER
T. Boyce

OBSERVERS

DATE
8 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

					CHANNELS						
BAND	45	46	47	48	49	50	51	52	53	54	55
1	3.47	3.44	3.40	3.51	3.46	3.40	3.42	3.52	3.60	3.39	3.57
2	12.96	12.96	12.99	12.99	12.99	12.97	12.98	12.99	12.99	12.99	12.99
3	7.75	7.70	7.80	7.60	7.85	7.69	7.95	7.77	8.33	7.84	7.80
4	4.65	4.60	4.62	4.41	4.70	4.65	4.69	4.66	4.73*	4.68	4.55
									*10.6 MA		
	56	57	58	59	60	61	62	63	64		
1	3.47	3.49	3.29	3.43	3.45	3.36	3.58	3.53	3.51		
2	13.01	13.02	13.04	13.00	13.05	13.04	13.04	13.04	13.04		
3	7.83	7.53	7.59	7.57	7.79	8.01	7.95	7.70	7.85		
4	4.82	4.44	4.52	4.49	4.49	4.63*	4.50	4.60	4.58		
						*10.6 MA					

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #16

TEST ENGINEER: T. Boyce | OBSERVERS: | DATE: 9 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

					CHANNELS						
BAND	1	2	3	4	5	6	7	8	9	10	11
1	X	4.48	3.40	3.40	3.39	3.49	3.48	3.32	3.40	3.36	3.42
2	X	13.05	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.06	13.04
3	X	7.81	7.53	7.60	7.72	7.76	7.46	7.66	7.65	7.56	8.11
4	X	4.54	4.40	4.43	4.59	4.36	4.40	4.54	4.42	4.41	4.55*
											*10.5 MA
	12	13	14	15	16	17	18	19	20	21	22
1	3.45	3.46	3.39	3.48	3.43	3.43	3.22	3.29	3.27	3.34	3.46
2	13.05	13.04	13.04	13.04	13.05	13.05	17.95	17.91	17.93	17.92	17.92
3	7.82	7.74	7.48	7.24	7.87	7.50	7.60	7.60	7.44	7.45	7.52
4	4.63	4.40	4.41	4.30	4.59	4.47	4.49	4.50	4.34	4.32	4.34
							Changed constant current Source - using NADC #4				
	23	24	25	26	27	28	29	30	31	32	33
1	3.41	3.43	3.41	3.32	3.47	3.33	3.47	3.31	3.47	3.34	3.45
2	17.96	17.96	17.84	17.95	17.99	17.99	17.99	17.99	17.99	17.99	17.99
3	7.78	7.71	7.59	7.58	7.65	7.83	7.62	7.61	7.53	7.53	7.60
4	4.39	4.33	4.32	4.32	4.50	4.46	4.32	4.34	4.31	4.31	4.51
	34	35	36	37	38	39	40	41	42	43	44
1	3.40	3.40	3.48	3.32	3.39	3.44	3.41	3.39	3.45	3.48	3.37
2	17.99	17.99	17.99	18.24	18.19	18.25	18.24	18.25	18.25	18.25	18.24
3	7.82	7.60	7.64	7.94	7.99	7.88	7.58	7.94	7.81	7.43	7.70
4	4.54	4.44	4.51	4.63	4.57	4.56	4.46	4.42	4.47	4.32	4.48

PLATE NO. 20894

LABORATORY TEST SHEET
4ND-NADC-3960/45 (3-71)

LABORATORY

TEST OF
SOSTEL Terminal Test Panel #16 (Cont.)

TEST ENGINEER
T. Boyce

OBSERVERS

DATE
9 Oct 1980

TEST EQUIPMENT
Control Panel Bit Power Controller #1

					CHANNELS						
BAND	45	46	47	48	49	50	51	52	53	54	55
1	3.34	3.36	3.34	3.40	3.45	Intermit Switch	3.36	3.30	3.27	3.44	3.46
2	18.25	18.25	18.06	17.94	17.99	-	18.27	18.25	18.19	18.14	18.18
3	7.80	8.03	7.45	7.80	7.61	-	7.64	7.50	7.51	7.51	7.74
4	4.34	4.30*	4.34	4.33	4.46	-	4.48	4.36	4.37	4.38	4.61
		*10.4 MA									
	56	57	58	59	60	61	62	63	64		
1	3.29	3.49	3.43	3.42	3.48	3.39	3.48	3.38	3.44		
2	18.17	18.18	18.19	18.18	18.10	18.18	17.99	18.10	18.09		
3	7.65	7.77	7.50	7.76	7.80	7.69	7.66	7.83	7.74		
4	4.43	4.57	4.37	4.57	4.46	4.35	4.37	4.56	4.58		

PLATE NO. 20H94

CONCLUSIONS

The air cooled generator coolant heat exchanger has been purged of Coolanol 25; fire damage has been identified and is being repaired; turbine oil MIL-L-23699, to be used as the coolant fluid, has been ordered and received; and Fisher and Porter turbine flowmeter 10C1510A is suitable for use to monitor MIL-L-23699 coolant flow up to 5 gallons per minute at room ambient temperature ($25^{o}C$) and above.

Operational tests were performed on sixteen SOSTEL terminal test panels. All sixteen panels must be modified to correct the Band 1, short/fault condition, output level. Data on all sixteen panels must be reviewed and out-of-tolerance conditions must be corrected and channels with missing data must be fault tested and corrected.

RECOMMENDATIONS

Thermostatic control of coolant water should be provided for the Westinghouse/Robicom 200 HP test stand heat exchanger temperature actuated modulating valves are available. One type, Penn Control Model V47AC6, operating range 75 to 135^{o}F, is available from Johnson Controls Inc. (312-654-4900), Control Products Division, P.O. Box 486, 2221 Camden Court, Oakbrook, IL 60521.

The video tape record of the recent 270 VDC generator fire was a valuable asset for failure analysis. The existing Sony Model 2600 video tape recorder which is used in the test facility does not provide an automatic continuous record, rewind, record function. The Sony 2600 records and automatically rewinds but does not then continue to record. It is recommended that an as-continuous-as-possible video record function be provided at this test facility.

It is recommended that an automatic or remote manually operated carbon dioxide extinguisher be provided for each test stand. Auxiliary power units on Navy aircraft have an automatic extinguisher system which might be used for this application.

It is recommended that an elapsed time meter be installed in the test facility for logging operating time of test units.

All SOSTEL terminal test panels should be inspected for good solder joints and should be cleaned of solder splash prior to shipment.